

PROJECT DOCUMENT

Status: PUBLIC

Enquiry Analysis of the CEN-standards on Heating Systems and Domestic Hot water. Recommendations

Johann Zirngibl and Claude François

CSTB Energy Environment Development and Prospective
Email: johann.zirngibl@cstb.fr; claude.francois@cstb.fr

CENSE_WP4.3_N01

March 15, 2010

IEE-CENSE

*Leading the CEN Standards on Energy performance of buildings to practice
Towards effective support of the EPBD implementation and acceleration
in the EU Member States*

Supported by

Intelligent Energy  Europe

Contract EIE/07/069/SI2.466698

<back side of front page; save trees and money by printing double-sided>

Contents

1	The CENSE Project	5
2	Aim of the report	5
3	Specific enquiry (software workshop Brussels, 29th of June 2009)	6
3.1	Introduction	6
3.2	Software enquiry	6
3.2.1	Software tools for non EPBD purposes	6
3.2.2	Software tools for national EPBD purposes and possible options	8
3.2.3	CEN standards and software	9
4	Short questionnaires about EN 15316 – EN 15378 – EN 15459	12
5	Conclusions and Recommendations	17
	Annex A – Overview short questionnaire results	21
	Annex B – CENSE Software workshop enquiry (Brussels June 29, 2009)	23
	Annex C – Three Short Questionnaires about EN 15316 – EN 15378 – EN 15459	24

Disclaimer:

CENSE has received funding from the Community's Intelligent Energy Europe programme under the contract EIE/07/069/SI2.466698.

The content of this document reflects the authors view. The author(s) and the European Commission are not liable for any use that may be made of the information contained therein.

1 The CENSE Project

The objective of the IEE CENSE project (2007-2010) is to accelerate the adoption and improved effectiveness of EPBD related building energy performance standards from CEN in the EU Member States.

The aim of the CENSE project (2007-2010) is to support the EU Member States (MS) and other target groups in achieving better awareness and more effective use of the European (CEN) standards that are related to the EPBD.

The main activities in the project are:

- 1) to communicate the role, status and content of these standards as widely as possible, and to provide guidance on their implementation;
- 2) to collect comments and examples of good practice from the MS, so as to remove obstacles to implementation, and to collect and secure results from relevant SAVE and FP6 projects;
- 3) to prepare recommendations to CEN.

The IEE CENSE project initiates a number of international/regional workshops:

- to present their work plan and the interim results on information on the CEN standards;
- to get feedback from the Member States or other target groups on possible obstacles to use of the standards and on good practice examples;
- to identify together the ways for an increased convergence.

More information on the project can be found at the website (www.iee-cense.eu).

2 Aim of the report

The aim of this report is to establish a list of recommendations which might be useful for the revision of the CEN standards.

These recommendations result from the experiences of CENSE Partners about the existing set of CEN standards and from the knowledge delivered by the feedbacks of the Members States through their answers to enquiries and questionnaires.

This report is based on:

- one specific enquiry among the participants related to a workshop on software, organised in Brussels on June 29th, 2009 (see **annex B**),
- a short questionnaire sent to the Member States contacts (see **annex C** for the questionnaire, **annex A** for summary of results).

Only very few design tools are considering economical aspects.

- Yearly calculations

Even for non EPBD purposes the yearly calculation is still made under steady state conditions but dynamics methods are also proposed and represent more than 60 % of the software offer. Steady state methods are linked to a monthly calculation step.

	Data exch.	Design tools (Sizing / Power)		Yearly calculations (i.e. energy consumption, running costs)				
		Content		Calculation		Calculation step		
		technical	economical	steady state	dynamics	yearly	monthly	hourly
Energy	IFC, XML							
heating	9	16	3	12	8	5	12	7
cooling	9	15	3	10	8	5	11	7
ventilation	6	14	3	9	7	3	9	6
hot water	6	15	3	10	6	3	8	3
lighting	5	10	3	7	3	3	5	4

Design tools:

Quite all the thermal energy uses (EPBD) are technically treated.

Lighting (electrical use) is proposed by 2/3 of software design tool providers

> holistic approach for design

Few design tools are considering economical aspect

Yearly calculations:

Still mostly under steady state conditions with monthly calculation step.

Dynamic methods are coming with hourly calculation step.

3.2.1.2 Other topics

In the questionnaires was asked if software for other topics then energy, but related to energy and buildings were developed or sold. A list of items was proposed (**see table below**):

According to the answers given, these items could be ranged in the following order (most = first):

- summer comfort;
- acoustics;
- environment;
- indoor air quality;
- architecture.

It is surprising that there are only few software tools on indoor air quality developed or sold by the participants of the workshop (mainly dealing with the energy performance of buildings). In the future this topic will become more and more important especially with the development of low energy houses (high air tightness, controlled ventilation).

	Data exchange	Design tools (Sizing / Power)		Yearly calculations (i.e. energy consumption, running costs)				
		Content		Calculation		Calculation step		
Summer comfort	5	9	1	5	6	6	3	5
Indoor air quality	5	3	1	2	2	1	1	1
Environment	3	5	1	4		4		1
Architecture	4	2		1	1	2	1	1
Acoustics	2	7	1	5		1		2

Summer comfort and acoustic:

Only few software tools on indoor air quality (important for low energy houses)

3.2.2 Software tools for national EPBD purposes and possible options

In this section the questions are related to the country regulations about software linked to the EPBD transpositions and options. The different requirements of the directive were distinguished (see table below):

The Directive requires a procedure to evaluate the energy performance of a building (article 3). The energy performance of a building is the amount of energy actually consumed or estimated. This energy use can be calculated or measured.

Member States shall take the necessary measures to ensure that minimum energy performance requirements are set, based on the methodology (article 4).

Member States shall ensure that when buildings are constructed, sold or rented out, an energy performance certificate is made available (article 7). Although the Directive does not explicitly demand it, the same procedure can be used for the rating usually shown in the display of the energy certificate (example: A- to G scale).

Software might also be used to support the inspection requirements (articles 8 and 9).

External data bases, for example HVAC product characteristics provided by the industrials, can be used as a data input to the software and highly facilitate the use of the software.

The enquiry show that external databases are not very much used (30%). Among the lowest requirements using databases is inspection, despite the help and information that could provide databases in this field.

The Directive requires a procedure but it does not forbid several procedures, for example on a national basis. At national level the procedure may be mandatory (obligatory) or not.

In most countries the procedures related to the requirements of the Directive are mandatory except for inspection and measured energy use. This underlines that the Member States have still some difficulties to deal with these items.

Even if there is only one acceptable procedure in a country, there may be one or several software implementations of it. In about 50% of the replies, the mandatory procedure is associated to mandatory software. Again, there is an exception fro measured energy use and inspection. If the software is mandatory, very often a free software (70%) is provided (e.g. financed by public authorities).

The enquiry shows that other tools are allowed in many countries for the energy use (50%), even if the procedure is mandatory, but not for minimum requirements and certificates.

If other tools are admitted the question of accreditation arises. Not all countries are asking systematically for accredited software.

Sometimes software companies can use the calculation motor of this free software and develop commercial interfaces to facilitate the use (for example for data input, graphical interfaces etc). For the energy use calculation, many commercial interfaces has been developed and find there place in the national regulatory system. Their number is equal, or even higher then free software.

Four software companies indicated that their software is used in other countries. The "use" of the software should be detailed because there are different options: in France there is a mandatory procedure for the certificates, but tools based on CEN standards are allowed, otherwise the tools have to respect the procedure.

	Ext. Data bases (inputs, results)	Procedure mandatory	Software mandatory	Free software	Other tools allowed	Accreditation needed	Commercial Interfaces	used in oth. countries
Energy use calculated	6	19	11	7	8 ?	5	8	4 ?
measured	2	7	2	3	4 ?	1	2	2
Min.requirement	4	12	7	5	3 ?	2	3	3
Certificates (rat)	3	14	7	5	4 ?	4	2	2
Inspection	2	7	2	2	2	1	1	1

External data bases have low development !!!!

Procedures are mostly mandatory except for inspection and measured energy use

Software is mandatory for 50 % (often free software provided)

Few countries are asking for the accreditation of software

The number of commercial interfaces is greater then free software

The link with inspection is not made; it seems that today no really integrated tool is available

> software development on international level if not linked to national procedure (option: CEN)

3.2.3 CEN standards and software

The third section of the questionnaire deals with:

- the awareness on the CEN standards,
- their use in software;
- the availability of national annexes (example: climate).

In the questionnaire is also asked the opinion about:

- the structure;
- the content;
- the need for major changes in the standards.

Awareness on the CEN standards

The **figure below** indicates the degree of awareness and use of the CEN standards. Three packages of standards can be distinguished:

1. standards in use since years and needed for sizing or building regulation:
EN 12831 (heat load), EN 13790 (energy use);

and top standards of the EPBD mandate:
EN 15603 (holistic approach), EN 15217 (certificate);

2. new EPBD standards dealing with technical building systems
EN 15316 (heating systems), (EN 15214 ventilation), EN 15193 (lighting);
3. economical calculations (EN 15459).

The first category is well know (>50%), the second category is known (50 % <> 25 %), the third category is less know (<25%).

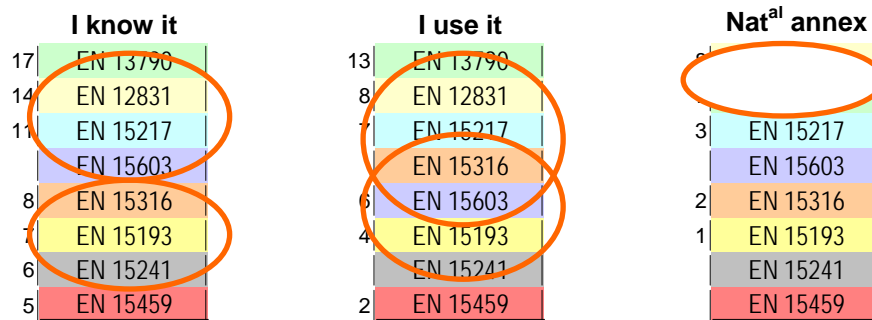
Use of CEN standards in software

The use of the standards in software varies between 70 % (EN 13790) and 10% (EN 15459).

The meaning of "use" can be very different. It can vary from the strictly and complete application of the standard, to partly copy it or to follow only the principles.

The availability of a national annex can be an indicator for the use of standards. Only for the standards needed for sizing and building regulation national annexes have been developed in several countries (>35%).

EN 13790 and EN 12931 are known and used. The standards of the CEN EPBD package are known but not really used today.



<p>Awareness standards needed for sizing or building regulation: EN 12831 (heat load), EN 13790 (energy use), top standards of the EPBD mandate EN 15603 (holistic approach), EN 15217 (certificate),</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">>50%</div>
<p>new EPBD standards dealing with technical building systems EN 15316 (heating), (EN 15214 ventilation), EN 15193 (lighting),</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;">50% < > 25%</div>
<p>economical calculations (EN 15459)</p>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 0 auto;"><25%</div>
<p>Use Varies from 70 % (EN 13790) to 10%. "Use" can have different meanings</p>	
<p>"Real" use (national annex) EN 12831, EN 13790</p>	
<p>EN 13790 and EN 12831 are known and used.</p>	
<p>The standards of the CEN EPBD package are starting to be known but not really used today.</p>	

When the standards are known, the structures of the EN standards are judged sufficiently clear, especially for the well-known standards (probably because people started to work with the standards). In general the content is appreciated for these groups of standards (**see table below**).

Efforts have still to be made on the structure and the content for the technical building systems standards (heating, ventilation and lighting).

Often the CEN standards are characteristic by: "too detailed", "too many options"

Software developers estimate that the methods are detailed enough, except for the technical building systems (the most for lighting and economic). Also for these types of standards fewer options and major changes are needed.

	Heat load EN 12831	Rating EN 15217	En. use EN 15603	En. need EN 13790	Heating EN 15316	Ventilation EN 15241	Lighting EN 15193	Economic EN 15459
I know these standards	14	11	11	17	8	6	7	5
I use them in our software	8	7	6	13	7	4	4	2
national annex available	8	3	3	7	2	1	1	1

If you know these standards, give a note from 5=best to 0=bad

structure clear	4.5	4.3	4.2	3.9	3.6	3.0	3.1	3.6
good content	4.2	4.1	4.2	4.1	3.4	3.6	3.3	3.6

Agree or disagree from 5= I agree to 0= I disagree

more detailed method needed	1.3	1.4	2.1	1.3	2.6	2.5	3.0	3.0
less options needed	1.6	3.1	2.1	1.8	4.2	3.0	3.8	2.7
major changes needed	2.3	2.0	1.7	1.5	4.2	3.3	3.2	3.7

When known, the structure / content of the EN standards are judged sufficiently clear

Efforts have still to be made on the structure and the content for the technical building systems standards (heating, ventilation and lighting).

The technical building systems standards has to be updated (major changes needed)

4 Short questionnaires about EN 15316 – EN 15378 – EN 15459

A short questionnaire has been sent to Member States Contacts. The questionnaires were dealing with cluster on Heating systems (EN 15316 series), Inspection (EN 15378), and Economic calculations (EN 15459). Answers has been received from 9 countries:

- Austria;
- Belgium;
- Denmark;
- France;
- Germany;
- Italy;
- Slovakia;
- Switzerland;
- Czech Republic.

The answers concern all buildings sectors, with a majority for residential buildings. People answering are mostly interested or involved in heating appliances.

Answering can be done by simply “giving a number” by using the following scale:

Scale 5-1 (5= I highly agree; 1= I do not agree at all; ?= I don't know)

The answers to the 3 short questionnaires (EN 15316, EN 1578, EN 15459) are given here-under:

- firstly with a table presenting the average mark for each of the three standards,
- secondly with a comment or brief analyse.

Personal background:

To situate the answers in their context, the following three questions are dealing with the personal background.

- “I am **not so closely involved** in the methodologies used or prepared for the national building regulations, so my response is my personal impression”:

15316	15378	15459
2,2	2,6	2,2

Persons who answered are involved. Les persons are dealing with inspection.

- “My response is mainly based on my **professional experience**”:

15316	15378	15459
4,4	4,5	4,4

Answers are based on professional experience.

- “My response is based on experience as **writer** of national **standards** or codes”:

15316	15378	15459
3,4	3,4	3,6

Persons are quite involved in writing standards or codes.

Questions

Then three mains questions where dealing with:

- the content of the specific CEN standard or cluster (major changes, etc.);
- the operational obstacles need to be removed to implement the standards;
- the major steps needed to implement the standards in the building regulation.

The questions had several sub questions for more detailed investigations.

Question 1: Which major changes in the content of this specific CEN standard/cluster of CEN standards are required to make it/them applicable for the national building regulations?

Q1-1: Our **national building regulations do not ask** for the kind of procedures as laid down in this specific standard/cluster of standards and consequently it is not relevant for us:

15316	15378	15459
1,7	2,0	3,9

The relevance of standards is very different. Heating systems are treated in the building regulations, but economic calculations not yet

Q1-2: Its **structure is clear** and understandable

15316	15378	15459
3,8	3,3	3,4

The structures appear quite clear and understandable but there is potential for improvement.

Q1-3: It contains **many choices** to be made or to be worked out at national level:

15316	15378	15459
3,0	3,5	3,0

People agree that there are a lot of choices especially for inspection.

Q1-4: A **national annex** or national "guidance document" describing how this CEN standard must be used to meet the national or regional building regulations **is not feasible** because too many options, boundary conditions and input data have to be specified:

15316	15378	15459
2,4	3,0	2,3

It seems that there are not too many options to make a national annex, may be less for the EN 15378.

Q1-5: A systematic **split** between the (harmonized) method and the (national/regional) input data would make it easier to write a national annex or national guidance document:

15316	15378	15459
3,1	2,8	2,0

A systematic split seems to be more needed for the EN 15316 series.

Q1-6: It requires **more** background information or **guidance** to be able to use it:

15316	15378	15459
2,9	3,0	1,7

Background information is more needed for EN 15378 and less for EN 15459.

Q1-7: It **covers all** relevant issues:

15316	15378	15459
3,7	3,1	3,3

People seem to agree that all relevant issues are covered.

Q1-8: It needs to contain a **more concrete** method:

15316	15378	15459
1,5	3,3	2,5

It is confirmed that EN 15316 series are concrete method and EN 15378 is more a proposal.

Q1-9: It needs to provide **more normative options** to choose:

15316	15378	15459
1,7	1,9	2,2

More normative options are not needed.

Q1-10: It needs to provide **fewer options** to choose:

15316	15378	15459
2,6	3,7	2,7

It seems that EN 15378 might provide fewer options.

Q1-11: It needs to be **more detailed**:

15316	15378	15459
2,1	2,1	1,8

The standards don't need to be more detailed.

Q1-12: It needs to be **less detailed**:

15316	15378	15459
3,1	3,5	2,7

EN 15316 and EN 15378 seem to be too detailed.

Q1-13: It needs to be made **more unambiguous**:

15316	15378	15459
3,3	3,0	1,8

EN 15459 is unambiguous; EN 15316 and EN 15378 might tend to.

Q1-14: It needs no major changes:

15316	15378	15459
2,0	2,5	3,2

Major changes are wanted for EN 15316 and EN 15378.

Question 2: To your opinion, which main operational obstacles need to be removed to implement this specific CEN standard/cluster of CEN standards in the national building regulations?

Q2-1: There is **no operational obstacle**: this specific CEN standard/cluster of CEN standards is or will (in near future) be put in force by our national/regional regulation:

15316	15378	15459
4,0	3,3	1,8

EN 15316 series and EN 15378 will be put in force by national regulations. This is not the case for EN 15459.

Q2-2a: It requires a lot of time and energy to agree nationally upon the national method, thus:

o **adding a CEN circuit would only mean more time and effort and added risk that the procedures are not available in time or do not describe what is nationally needed:**

15316	15378	15459
2,0	3,2	2,5

People do not think that adding a CEN circuit should will mean a more time and risk for EN 15316 and EN 15459. This is not the case for EN 15378 (inspection) probably because the national differences are bigger.

Q2-2b: o we would probably implement these CEN standards in the near future in case of a **transparent planning of revisions** of these CEN standards (when and what)”:

15316	15378	15459
2,5	2,0	2,2

The lake of transparent planning is not considered as a major obstacle.

Q2-3: A major obstacle is that the **timing of the CEN standards did not coincide** with the timing at national level (from projectplan to implementation in law and application in practice):

15316	15378	15459
2,5	2,8	2,8

Timings don't appear as an obstacle neither.

Q2-4: We need a national method that is compact; consequently we (intend to) **integrate selected parts** from this specific CEN standard/cluster of CEN standards:

15316	15378	15459
2,2	3,4	2,8

It seems that in general the standards are integrated as a whole. Compactness is not a major problem.

Q2-5: A major obstacle is that these CEN standards **does not enable us to link** the calculation method to national product certification (national product labels or quality marks):

15316	15378	15459
1,5	2,5	1,0

The absence of link between the CEN standard and a national certification seems to be an obstacle for EN 15378 but not at all for the others. This underlines again the national specificity of inspection.

Q2-6: This specific CEN standard/cluster of standards is **too hard to obtain** (price, copyright protection), compared to our national building regulations:

15316	15378	15459
2,8	3,0	2,7

The CEN standards seem to be rather hard to obtain.

Q2-7: People involved in our national or regional building regulations **should become involved in the CEN activities**; otherwise they go their own way:

15316	15378	15459
4,8	4,8	3,1

People involved in national regulations are clearly asked to be involved in the CEN standardization at least for EN 15316 series and EN 15378.

5 Conclusions and Recommendations

Heating and Domestic Hot Water systems – EN 15316 series

The current set of CEN standards was evaluated using feedback acquired through two questionnaires:

- Enquire among participants of a software workshop related to EPBD
- Questionnaires sent out to Member State contacts involved in national building regulations.

This feedback, supplemented with personal (national) experience of the experts involved in the CENSE project, was used to make a set of recommendations to improve the current set of CEN standards.

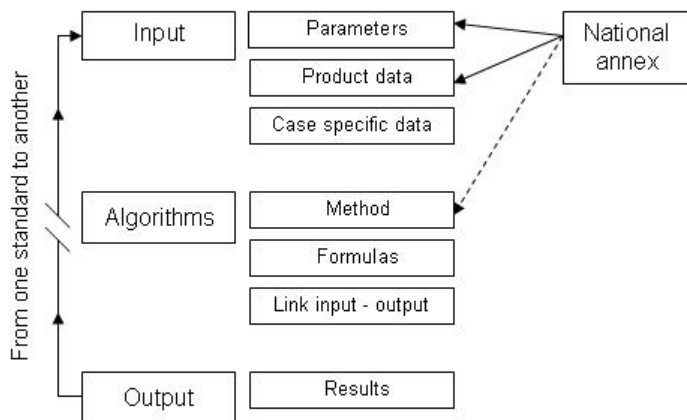
These improvements aim at a better (direct) implementation of the standards in the Member States, through

- an improved and harmonized structure,
- connecting loose ends
- adding additional components to the set of standards.

Improve the structure of the standards

- A clearer, better understandable structure.

This should be done by making a clear distinction between input, algorithms (formulas) and output, and also between the normative method and the data and choices in national annexes. The links between in- and output of different standards have to be explicit. Below is a graphical representation:



- A reduction of options/methods.

Where possible the number of methods in the standards should be reduced. In some cases more than one option is necessary to make a method applicable in all situations or countries. The different options in the standards should be critically reviewed to see where options can be removed or integrated with other options.

- More unambiguous standards.

The standards should be software proof (e.g. Excel sheet related to each standard). There should be no room for 'interpreting' a standard. In the future, the main readers of the standards will be the software houses. Standards should not longer have a text book character. The calculation standards should be structured by: input data, flow chart, algorithm, output data.

- Overview of required input + reference to input source.

- Possibility for simplified input – less detailed methods

Feedback on the standards consistently asks for less detailed standards. However, the real question doesn't seem to be the need for simplified methods. The standards will not be applied "by hand", but by using a software tool, so complex methods do not affect the end user.

The real question is for more simplified input options. Especially for existing buildings, not all input parameters can easily be achieved. The input parameters could be simplified by adding default values, which can be used if input variables are unknown. On the other hand, the time and effort needed to agree upon the details of such detailed methods in the standards should not be underestimated.

Add standards and add content

- New standard on operating conditions of generators (e.g. water temperature, source conditions, etc.) and multi-generators (different types of generators operating in the same zone);
- Information on how to treat generators providing heating and cooling simultaneously;
- More explicit treatment of air heating systems like air-to-air heat pumps;
- Add shower heat recovery units;
- EN 15316-1:
 - o General structure to illustrate links between standards;
 - o Overall formulas, linking to the other EN 15316 standards;
- Correction for energy loss due to simultaneous heating and cooling (more interaction heating and cooling standards where necessary);

Uniform definitions – common building and system descriptions

Uniform input, output, terms, symbols and building description for the standards is needed to enable software manufactures to make a common software package for standards. Furthermore, the same building description and set of input, output, terms and symbols can be used for design tools.

More links between Inspection and certification

Energy performance of building is starting with design and finishing with building operation. Most of these steps are dealt with in the EPBD (holistic approach). The interactions between these actions should be reflected also in the related standards. For example it should be shown how the information of inspection could be linked and used for certification.

Take into account dynamic calculations, based on hourly steps, in the standards

The energy calculations are still mostly under steady state conditions with a monthly calculation step. This calculation does not take into account correctly:

- The interactions (e.g. envelope, systems) especially in low energy houses;
- The performance of modern systems (e.g. heat pumps).

As in most cases the calculation is made by computer tools, if needed, the simplification should not be on the calculation method but on the input data.

Work out standards for measured energy used in building inspection and building certification

A part of the inspection of buildings and systems could be actual measurement of energy. This could be used to evaluate real energy performance. An important factor in this respect is user behaviour. A measurement methodology (complementary to what is described in EN 15603 on this subject, focussing on the systems) should describe how real energy use can be measured and what factors may influence the energy use.

This way the inspection standard could act as a tool for improvement of the energy efficiency of buildings, systems and users.

Measured energy rating (operational rating) could be an alternative to calculated energy rating where the influence of the user behaviour is less individual (e.g. office buildings, schools).

More commitment

In the feedback from national experts on national building regulations, the absence of national experts on the European level was mentioned as a principal obstacle for the implementation of CEN standards at a national level. Solutions should be proposed to make national experts more closely involved in the development of a new set of standards. Elements like a transparent time plan, an overall set of basic principles and a common format for the standards and the national annexes will make this easier.

Annex A – Overview short questionnaire results

See **Annex C** for the questionnaire itself.

Personal background (see table)

The people replied are qualified persons because they are:

- building professionals involved in national building regulations and national standards;
- dealing with the sector where the standards are related to (heating systems).

Table: Personal background:

		15316	15378	15459
PB-1	<i>not</i> closely involved in national building regulations	2,2	2,6	2,2
PB-2	response is mainly based on my professional experience	4,4	4,5	4,4
PB-3	experience as writer of national standards or codes	3,4	3,4	3,3,6

Question 1: Which major changes in the content of this specific CEN standard/cluster are required to make them applicable for the national building regulations?

Table:

		15316	15378	15459
Q1-1	national building regulations do <i>not</i> ask for the standard	1,7	2,0	3,9
Q1-2	structure is clear and understandable	3,8	3,3	3,4
Q1-3	contains many choices	3,0	3,5	3,0
Q1-4	national annex is not feasible because too many options	2,4	3,0	2,3
Q1-5	split between method / national data easier to write NA	3,1	2,8	2,0
Q1-6	requires more guidance to be able to use it:	2,9	3,0	1,7
Q1-7	covers all relevant issues :	3,7	3,1	3,3
Q1-8	needs to contain a more concrete method	1,5	3,3	2,5
Q1-9	needs to provide more options to choose	1,7	1,9	2,2
Q1-10	needs to provide less options to choose	2,6	3,7	2,7
Q1-11	needs to be more detailed	2,1	2,1	1,8
Q1-12	needs to be less detailed	3,1	3,5	2,7
Q1-13	needs to be made more unambiguous	3,3	3,0	1,8
Q1-14	needs no major changes	2,0	2,5	3,2

Question 2: To your opinion, which main operational obstacles need to be removed to implement this specific CEN standard/cluster of CEN standards in the national building regulations?

		15316	15378	15459
Q2-1	no operational obstacle: this specific CEN standards is or will be put in force by our national/regional regulation:	4,0	3,3	1,8
Q2-2a	It requires a lot of time to agree nationally thus: o adding a CEN circuit mean more time and added risk	2,0	3,2	2,5
Q2-2b	o we would implement these CEN standards in case of a transparent planning of revisions (when and what)”	2,5	2,0	2,2
Q2-3	A major obstacle is that the timing of the CEN standards did not coincide with the timing at national level	2,5	2,8	2,8
Q2-4	We need a national method that is compact; we (intend to) integrate selected parts from these CEN standards:	2,2	3,4	2,8
Q2-5	these CEN standards does not enable us to link the calculation method to national product certification (labels)	1,5	2,5	1,0
Q2-6	These CEN standards are too hard to obtain (price, copyright protection), compared to national regulations:	2,8	3,0	2,7
Q2-7	People involved in our national regulations should become involved in CEN , otherwise they go their own way:	4,8	4,8	3,1

Annex B – CENSE Software workshop enquiry (Brussels June 29, 2009)

1) Your software tools for non EPBD purposes

	Data exchange (IFC, NBDM)	Design tools (Sizing / Power)		Optimisation tools (energy consumption)				
		Content		Calculation		Calculation step		
		technical	economical	steady state	dynamics	yearly	monthly	hourly
Energy								
heating								
cooling								
ventilation								
hot water								
lighting								
Acoustics								
Build. structure								

2) Your software tools for EPBD purposes

	Data exchange (IFC, NBDM)	Software mandatory	Procedure mandatory	Other tools allowed	Agreement needed	Free software	used in oth. countries
Minimum perf. requirements							
Energy use calculated							
measured							
Display Energy Certificates							
Inspection							

3) CEN standards and software

	Heat load EN 12831	Rating EN 15217	Overall energy use EN 15603	Energy need EN 13790	Heating EN 15316	Ventilation EN 15241	Lighting EN 15193	Economic EN 15459
I know these standards								
I use them in our software								

Give a note from 5=best to 0=bad

structure clear								
good content								
Agree or disagree from 5= I agree to 0= I disagree								
more detailed method needed								
less options needed								
major changes needed								

Annex C – Three Short Questionnaires about EN 15316 – EN 15378 – EN 15459

Mail addressed to all the CEN list of contacts:

Dear colleagues,

On topic: **EN 15316 series** "heating systems in buildings"

(Idem: On topic: **EN 15378** "Inspection of boilers and heating systems")

(Idem: On topic: **EN 15459** "Economic evaluation procedure for energy systems in buildings")

The European project IEE CENSE (www.iee-cense.eu) supports the EU Member States and other interested parties, aiming at better awareness and a more effective use of the set of European (CEN) standards that are related to the European Energy Performance of Buildings Directive (EPBD).

The CEN standards are typically published by the national CEN Member Body as EN-national standard (translated or not); optionally with a national annex containing the relevant national choices, boundary conditions and input data.

However, concerning the use of the CEN methods in the *national building regulations*, the CENSE Information Paper P90, available at the website (http://www.iee-cense.eu/upload/sites/iee-cense/wp6/6.5/p090_en_cense_overview_use_cen_standards.pdf) shows that in many Member States the CEN standards are used only in a "practical way", e.g. by copying only parts of the technical content into national documents, mixed with national methods and data.

The ultimate goal is that national or regional building regulations in each Member State will refer to the CEN standards for the methodology to assess the energy performance of the building, its systems and/or their components. Thus more transparency, efficiency and harmonisation will be achieved.

For the purpose of finding out the main obstacles for implementation of each of these standards in national or regional building regulations, if there are any, we developed a number of questionnaires on specific topics. The collected responses will be used to prepare recommendations to CEN for the second generation of CEN standards to support the EPBD. Those will be developed within the next few years.

Knowing that the persons who are capable to give us the requested information are as a rule extremely occupied, this Email, which contains a few questions and can be answered within a couple of minutes

We kindly ask you to quickly answer the questions below, by simply typing in your reply-email..

Please send us a reply-email with your answers to the questions before ...

Thank you very much in advance for your effort and your cooperation and see you soon in Berlin!

Johann Zirngibl, WP4 leader
CSTB / France

Questionnaire on the following specific CEN standard/cluster of CEN standards:**EN 15316 series "Heating systems in buildings"***(Idem: EN 15378 "Inspection of boilers and heating systems")**(Idem: EN 15459 "Economic evaluation procedure for energy systems in buildings")*

Please send us a reply-email with your answers to the questions simply typed in.

Scale:

Answering can be done by simply "giving a number". In general, we offer a statement asking for your (dis-)agreement, where you can use the following scale: 5-0:

5 = I highly agree

4 = I agree

3 = I generally agree

2 = I hardly agree

1 = I do not agree at all

? = I don't know

Example:

- These instructions are clear: 5

Note: The response will be analysed manually, so feel free to add whatever comments!

Your personal background:

Scale 5-1 (5= I highly agree; 1= I do not agree at all; ?= I don't know)

- I am not so closely involved in the methodologies used or prepared for the national building regulations, so my response is my personal impression: __
- My response is mainly based on my professional experience: __
- My response is based on experience as writer of national standards or codes: __

My field of expertise/professional interest is:

My response refers to a specific country, namely:

My response refers to a specific sector (residential or non-residential buildings; new or existing buildings), namely:

Comments:

Question 1: Which major changes in the content of this specific CEN standard/cluster of CEN standards are required to make it/them applicable for the national building regulations.

Scale 5-1 (5= I highly agree; 1= I do not agree at all; ?= I don't know)

Concerning this specific CEN standard/cluster of CEN standards:

- Our national building regulations do not ask for the kind of procedures as laid down in this specific standard/cluster of standards and consequently it is not relevant for us: __
- Its structure is clear and understandable: __
- It contains many choices to be made or to be worked out with more detail at national level:

 - o A national annex or national "guidance document" describing how this CEN standard must be used to meet the national or regional building regulations is not feasible because too many options, boundary conditions and input data have to be specified:

 - o A systematic split between the (harmonized) method and the (national/regional) input data would make it easier to write a national annex or national guidance document: __

- It requires more background information or guidance to be able to use it: ___
- It covers all relevant issues: ___
- It needs to contain a more concrete method: ___
- It needs to provide more normative options to choose: ___
- It needs to provide fewer options to choose: ___
- It needs to be more detailed: ___
- It needs to be less detailed: ___
- It needs to be made more unambiguous: ___
- It needs no major changes: ___

- Other:

Comments (*Certainly you are always free and welcome to type comments as well. Content-related details, like which issues are not covered or which major changes are needed, are especially useful for us!*):.....

Question 2: To your opinion, which main operational obstacles need to be removed to implement this specific CEN standard/cluster of CEN standards in the national building regulations?

Scale 5-1 (5= I highly agree; 1= I do not agree at all; ?= I don't know)

- There is no operational obstacle: this specific CEN standard/cluster of CEN standards is or will (in near future) be put in force by our national/regional regulation: ___
- It already requires a lot of time and energy to agree nationally upon the national method, thus:
 - o adding a CEN circuit would only mean more time and effort and added risk that the procedures are not available in time or do not describe what is nationally needed: ___
 - o we would probably implement this specific CEN standard/cluster of CEN standards in the near future in case of a transparent planning of revisions of these CEN standards (when and what) : ___
- A major obstacle is that the timing of the preparation of CEN standards did not coincide with the timing decided at national level (from projectplan to implementation in the law and application in practice) : ___
- We need a national method that is compact; consequently we (intend to) integrate selected parts from this specific CEN standard/cluster of CEN standards: ___
- A major obstacle is that this specific CEN standard/cluster of CEN standards does not enable us to link the calculation method to national product certification (national product labels or quality marks) : ___
- This specific CEN standard/cluster of standards is too hard to obtain (price, copyright protection), compared to our national building regulations: ___
- People involved in our national or regional building regulations should become involved in the CEN standardization activities, otherwise they go their own way: ___
- Other:

Comments:

Question 3: Which major steps are needed to implement this specific CEN standard/cluster of CEN standards in the building regulations

- If in your country the CEN-standard is not implemented directly but its methods and equations are put in a national or regional regulation or in a national standard that differs from the CEN standard(s):
 - o Why do you think that is the case?
 - o And what needs to be done to make it possible to implement the standard itself?

Comments:

General comments:

Thank you very much for your cooperation! We will keep you informed on the results.

Please check our website (www.iee-cense.eu) regularly for information on these and other CENSE activities.

